

REMARKS

The Amendment, filed in response with Final Office Action mailed February 17, 2009 and Advisory Action mailed June 1, 2009, is believed to be fully responsive to all of the issues raised in the Actions. Favorable reconsideration on the merits and allowance of the application are respectfully requested.

Claims Disposition and Summary of the Amendments

The Amendment under 37 C.F.R. § 1.116 submitted May 14, 2009 was not entered on the ground that the Amendment does not deemed to place the application in a better form for appeal. By filing a Request for Continued Examination, Applicant respectfully requests entry and consideration of the amendments and arguments presented in the Amendment 1.116.

The instant Amendment under 37 C.F.R. § 1.114(c) reflects all of the amendments made in the Amendment under 1.116 as if they were entered, and thus, only amendments newly made in the instant Amendment are marked-up.

Upon entry of the Amendments under 37 C.F.R. §§ 1.116 and 1.114(c), *Claims 1-3 and 5-9 will be all the claims pending in the application.*

Claim 1 is amended to more clearly set forth the claimed subject matter by reciting the separator contains a surfactant (original claim 4) and the electrolyte contains sulfuric acid and a volatile organic acid. Claim 4 is canceled, accordingly (see Amendment 1.116). The new amendments to claim 1 is supported by the disclosure at page 13, lines 1-4 of the specification, Example 1, which describes “Acetic acid was added to sulfuric acid having a specific gravity of

1.280 so as to have a prescribed concentration followed by agitation, so that an electrolyte was prepared."

In the instant Amendment, claims 6-8, which are withdrawn from consideration as being directed to non-elected invention, are amended to include all of the limitations of claim 1. Claim 8 is amended to remove incorrect multiple dependency and claim 9 is newly added, which is directed to the subject matter canceled from claim 8. No new matter is introduced.

Claims 1-3 and 5 are not anticipated by Laird or Fujita

In the Final Office Action, Claims 1-3 are rejected under 35 U.S.C. 102(b) as assertedly being anticipated by Laird et al. (Laird, Edwin C., Samir B. Hanna. "Analysis of 4.5 mol/L sulfuric acid for organic compounds leached from battery separators." National Bureau of Standards Special Publication 519. Trace Organic Analysis: A New Frontier in Analytical Chemistry. Proceedings of the 9th Materials Research Symposium. 797-802. April 10-13, 1978, held at NBS, Gaithersburg, MD Issued April, 1979.)

Claims 1-3 are also rejected under 35 U.S.C. 102(b) as assertedly anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fujita (US 5,677,075 A).

In the Amendment under 37 C.F.R. § 1.116, claim 1 is amended to incorporate the features of claim 4, rendering the rejection moot. Therefore, upon entry of the Amendment under 37 C.F.R. § 1.116, the rejections under 35 U.S.C. § 102 should be rendered moot and withdrawn.

Claims 1-3 and 5 are Patentable over Fujita and O'Rell

In the Final Office Action and Advisory Action, claims 4-5 under 35 U.S.C. 103(a) as assertedly being unpatentable over Fujita in view of O'Rell et al. Applicant respectfully traverses at least for the following reasons.

References Fails to Teach All and Every Limitations of Claimed Subject Matter

In the Amendment under 1.116, Applicant argued that the Office's position is not sustainable, at least because the Office misread the limitations of claim 1 as if claim 1 requires the content of the volatile organic acid is equal to *250 mg or higher* per liter of said electrolyte," while claim 1 recites it as being *250 mg or lower*.

In the Advisory Action, the Office asserts that the relevant part of the Final Office Action contained a typographical error and the Office's intention was to mean it be "250 mg or lower," and that Fujita teaches the limitation "250 mg or lower" because Fujita discloses that the solution is approximately 3.1 wt. % of the carbon powder used to create the carboxylic acid (col. 10, lines 33-34) and that the amount of solution added to the lead acid battery is as low as 1-3 vol. % (col. 12, lines 4-8), and thus the acid concentration would be ($0.031 \times 0.03 = 0.00093$). See page 2 of the Advisory Action.

In addition the arguments presented in the Amendment 1.116, Applicant further respectfully submits the following arguments.

Fujita does not disclose or provides any suggestion to employ a lead-acid battery comprising a sulfuric acid electrolyte containing a volatile organic acid.

Although Fujita states "Water (pH:7) was used as an electrolyte solution" (column 10, line 23), the term "electrolyte solution" as used above in Fujita is, in fact, a treatment liquid prepared by dispersing (or suspending) carbon powder in water (pH 7). Here, the "electrolyte solution" is merely a dispersion (or suspension) of carbon in water, and is not an electrolyte which a lead-acid battery should employ. The dispersion of carbon in water is, according to Fujita, used to treat the surface of an electrode.

It is well-known in the art (e.g., Laird cited by the Office) that an electrolyte suitable for a lead-acid battery should contain sulfuric acid. According to Fujita, the "electrolyte solution" is used to indicate a dispersion of carbon in water, but not a lead-acid battery electrolyte which contains sulfuric acid. Thus, the electrolyte solution, which is a dispersion of carbon in water, cannot be an electrolyte suitable for a lead-acid battery.

In this regard, it is noted that Fujita states "After the formation liquid was extracted from the battery, the dilute sulfuric acid (of the specific gravity of 1.25) was filled therein. The battery was charged with currents of 0.5A for one hours. Thereafter, the battery was made to discharge constant currents (0.4A) " (Example 16, column 16, lines 41 to 46). Thus, according to Fujita, the "formation liquid" mentioned above is a dispersion of carbon in water (which is also stated as an "electrolyte solution") is extracted (removed) after its use in treating the electrode from the battery, and sulfuric acid is filled in the battery. At this point, the battery becomes (can be used as) a lead-acid battery, for the first time.

Accordingly, Applicant respectfully submits that, even if the carboxylic acid resulting from the electrode treatment using a dispersion of carbon in water, may be "a volatile organic

acid," no volatile organic acid remains in the battery as a result of a step of removing the treatment liquid as taught by Fujita.

O'Rell merely suggests that there is a case that a separator containing a surfactant is used as a separator used in a lead-acid battery. Moreover, Laird merely teaches that carboxylic acid is sometimes detected from the electrolyte of a lead-acid battery when it is analyzed.

Therefore, Applicant respectfully submits that none of the cited references, either alone or in combination, disclose or suggest all and every elements of currently amended claim 1.

Unexpected Superior Effects of Claimed Subject Matter

The claimed lead-acid battery defined in claims 1-3 and 5 of the instant application shows unexpected superior results by employing the sulfuric acid electrolyte containing a specific amount of volatile organic acid and employing the separator containing a surfactant.

In the specification of the instant application, Applicant provides various examples and tests comparing lead-acid batteries containing a volatile organic acid in the recited amount, in comparison with those containing no volatile organic acid or containing it in an amount outside the recited range. See Tables 1- 3 and Figures. Also, superior effects of the combination of a volatile organic acid and a surfactant are shown in Tables 4-5.

Accordingly, it is believed that claims 1-3 and 5 are patentable over Laird, Fujita and O'Rell, and allowance of these claims are respectfully requested.

Request for Rejoinder of Claims 6-9

In the instant Amendment, claims 6-9, which are withdrawn from consideration as being directed to non-elected invention, are amended to include all of the limitations of claim 1.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. Application No.: 10/577,220

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Applicant respectfully requests claims 6-9 be rejoined, should claims 1-3 and 5 are in the condition for allowance.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number **202-775-7588**.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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